



# Making Laying Hens A Successful and Profitable Part of your Farm

## Introduction

This handbook is specially written for creating a **profitable** pastured egg-laying operation. Whether you're just starting out or looking to refine your current setup, this guide is designed to offer practical insights, proven strategies, and a realistic approach to balancing profitability with sustainable and responsible farming practices. My goal is to share what I've learned to help you run a successful egg business rather than a costly hobby.

This handbook is focused on maximizing profitability while maintaining good husbandry practices. There are countless opinions about the “best” way to care for chickens, from lighting schedules and health care to coop designs and pasture management. While many approaches have merit, this guide emphasizes what I've found to actually work in the field—methods that increase production, reduce costs, and ultimately support a viable, sustainable business. Without employing these strategies, there's a strong likelihood that your operation will struggle to make a reasonable profit.

I've spent years running a pastured poultry operation on the Western Slope of Colorado, where the grazing season is limited but the potential for producing premium eggs is enormous. I've designed chicken feed with one of the country's top poultry nutritionists, owned and operated a feed mill, and sell layers of many different breeds for both my farm and Whiting Farms Hatchery. Through hands-on experience—along with plenty of trial and error—I've learned not only what works but what doesn't when it comes to creating a profitable operation.

In this handbook, I'll walk you through the core elements of success, including breed selection, pasture systems, housing, feed management, predator protection, hen health, and marketing. You'll also find actionable tips on avoiding common pitfalls and building a business model that suits your unique circumstances. The focus is on methods that have been tested and proven to support profitability while keeping your flock healthy and productive.

Eggs are an essential part of local food systems, offering a tangible way to connect consumers with the benefits of sustainable, small-scale farming. By following the principles outlined in this guide, you can meet the growing demand for premium, pastured eggs while creating a business that aligns with your goals and values.

## Why Add an Egg Business to Your Farm?

Right now, we're in a perfect storm of opportunity for small egg producers:

1. **Egg Prices Are Skyrocketing**  
With eggs at an all-time high, there's never been a better time to enter the market. Consumers are searching for high-quality, local alternatives to grocery store eggs—and pastured eggs can meet that demand.
2. **Good for the Environment** - Chickens are incredibly efficient animals. Compared to other livestock, they require far less expensive infrastructure, minimal land, and lower costs for vet

care. And unlike large-scale operations, small flocks on pasture contribute to soil health, reduce environmental impact, and offer a humane alternative to factory farming.

3. **Eggs Drive Traffic** - Whether you sell at a farmers' market, through a CSA, or directly from your farm, eggs are a gateway product. People come for the eggs and often leave with more—vegetables, honey, or other farm products. Chickens complement nearly every farming operation.
4. **Increased Food System Stability** - Large, centralized egg producers are vulnerable to major disruptions, as we've seen with Avian flu outbreaks. By encouraging many smaller flocks spread across diverse farms, we reduce the risk of catastrophic losses while increasing local food resilience.
5. **Minimal Startup Costs** - Compared to other livestock, chickens are affordable and accessible. Housing can be simple, feed costs are manageable, and flock management doesn't require specialized equipment or skills. For new or diversifying farmers, they're an excellent place to start.
6. **Supports Regenerative Practices** - Pastured chickens contribute to regenerative agriculture. Their foraging and manure improve soil fertility, aligning with sustainable farming principles.
7. **Chickens Are Farm Heroes** - Chickens bring more than eggs—they eat pests, contribute manure, and provide entertainment. A well-managed flock fits seamlessly into a sustainable farm system, enhancing the land and boosting productivity.
8. **Diversifies Income Streams** - Eggs provide a steady, reliable income year-round, even when other crops or products are seasonal. Poultry operations can also expand into pullet sales, manure for compost, or even agritourism.

## **Choosing the Right Breed for Your Pastured Laying Operation**

When it comes to the success of a pastured laying operation, the breed of chicken you choose is one of the most critical decisions. Hens are most productive in their first year of laying, with peak production typically occurring in their first 12 months. After that, egg production declines, which means choosing a high-production breed is essential for profitability. When we say a hen produces 300+ eggs per year at peak production, that means she's laying an egg almost every day—an impressive feat made possible by careful breed selection.

### **High-Production Breeds: The Cornerstone of Profitability**

While there are many beautiful and fascinating chicken breeds, the reality is that most are not suited to the demands of a commercial or small-scale profitable operation. For a laying operation to thrive, the breeds must be **high-production**, which means laying 300+ eggs per year under optimal conditions. These breeds are bred specifically for consistent egg production and tend to have a calm temperament, making them well-suited to both pasture and confinement. They also tend to lay eggs earlier (especially if properly fed), often between 16-20 weeks of age.

#### **Top High-Production Breeds for a Laying Operation:**

- **ISA Browns** – A favorite among small and large farms, these hybrids are prolific layers of large brown eggs.
- **Hy-Line Browns** – Known for their efficiency and high productivity, they are a top choice for many commercial farms.
- **Leghorns** – The gold standard for white eggs, Leghorns are lightweight and very feed-efficient.
- **Red Production Hens** – A hybrid designed for reliable brown egg production.
- **Ginger Browns** – Great layers with excellent adaptability to various climates.

- **Sexlinks (Black or Red)** – Easy to sex at hatch, these hybrids are consistent producers of brown eggs.
- **Amberlinks** – Reliable and calm, producing a steady supply of eggs.
- **Rhode Island Reds (High-Production Hatchery Lines)** – Some hatcheries, like Whiting Farms Hatchery, offer Rhode Island Reds bred for exceptional production, making them a viable choice for egg operations.

### **Breeds that are good producers of colored eggs**

These birds are bred for consistent high production, making them a great choice for farmers looking to add colorful eggs without sacrificing quantity:

- **Whiting True Blue** – lay powder blue eggs.
- **Whiting Green** – lay beautiful light green eggs.
- **High Production Marans Lines** - Marans are known for their dark colored, often heavily speckled eggs. While standard Marans may not produce as prolifically, carefully bred lines can offer both beauty and solid laying performance.

### **Reading Breed Descriptions Carefully**

Not all birds with the same name perform equally. Hatchery lines vary widely in terms of productivity and suitability for commercial operations. For example, while a backyard Rhode Island Red might lay fewer than 200 eggs a year, a high-production line from a reputable hatchery like Whiting Farms Hatchery can produce well over 300 eggs annually. Always read breed descriptions carefully, and don't hesitate to ask hatcheries about their production standards and specific lines.

Choosing the wrong breed can lead to disappointing egg yields, higher feed costs per egg, and reduced profitability. High-production breeds ensure your operation will have maximum egg output and economic efficiency. While heritage or ornamental breeds might be appealing, they're better suited for hobbyists or breeders rather than farms aiming for profitability.

### **Feed Conversion Ratios**

Feed conversion ratio (FCR) measures how efficiently a hen converts feed into eggs. A lower FCR means the bird produces more eggs for the same amount of feed, making her more cost-effective to keep. High-production breeds typically have excellent FCRs, which is crucial for profitability, as feed is one of the largest ongoing expenses in a laying operation. Choosing hens with good FCRs ensures you maximize egg output while minimizing input costs. In addition to the above list, Whiting Farms Hatchery specializes in birds with a high FCR, especially in colored layers such as Whiting Blues and Butter Blues.

A good feed conversion ratio (FCR) for laying hens generally falls between **2.0 and 2.5**. This means that the hen consumes 2.0 to 2.5 pounds of feed to produce one dozen eggs. Here's a breakdown of what this means in practice:

- **Excellent FCR (<2.0)**: Highly efficient birds like Leghorns or some hybrid layers can achieve FCRs below 2.0 in optimal conditions, minimizing feed costs.
- **Good FCR (2.0–2.5)**: Most high-production breeds like ISA Browns or Hy-Line Browns fall into this range, making them very cost-effective for egg production.
- **Average FCR (>2.5)**: Breeds in this range may still be productive but are less feed-efficient, leading to higher costs per egg produced.

Choosing birds with an FCR below 2.5 ensures you maximize profitability while maintaining a sustainable operation.

## **Buying Chicks vs. Adult Layers**

Choosing between raising chicks or purchasing adult layers is a critical decision that will impact the profitability, labor demands, and overall management of your egg-laying operation. Both options have advantages and challenges, and the best choice depends on your specific circumstances, resources, and goals.

### **Raising Chicks**

Raising chicks offers several benefits, particularly in terms of acclimating the birds to their environment. Chicks that grow up on your farm tend to adapt more easily to your management practices and pasture system, often resulting in higher egg production rates and better foraging once they reach maturity. Additionally, raising chicks gives you full control over their nutrition, health, and housing from the start, minimizing some risks associated with introducing adult birds.

However, raising chicks requires a significant upfront investment in time, equipment, and care. Brooders, heat sources, and specialized feeders are necessary to keep chicks safe and thriving during their early weeks. It also takes **20–26 weeks** before they begin laying eggs, creating a long lead time with no immediate return on investment. Furthermore, raising chicks can be risky—illness, injury, or improper management can result in losses before the birds even reach laying age.

The actual husbandry involved in raising chicks is beyond the scope of this handbook, and there are many excellent resources available to guide you through the process. However, we do recommend you consider using **heating plates** vs heat lamps for raising laying pullets. Heat plates are safer, and establishing natural light cycles early in development leads to fewer behavioral issues such as feather picking and cannibalism.

### **Chick Vaccinations**

Vaccinations can play an important role in protecting your flock from serious diseases, such as Marek's. Many hatcheries offer vaccinated chicks, and this is often the simplest and most cost-effective way to ensure basic protection. For small-scale farmers, vaccinating birds individually can be challenging and may not always be necessary, depending on your setup and risk factors.

While some farmers prefer to avoid vaccinations, especially for smaller, closed flocks, it's important to weigh the risks of disease against the potential benefits of prevention. Consult with your hatchery, local extension office, or a poultry vet to determine the best approach for your operation. Ultimately, the choice is yours, but it should be informed by your farm's unique circumstances and goals.

### **Purchasing Adult Layers**

Purchasing quality adult layers, specifically hens that are 16-30 weeks old, is often more profitable for operations. These birds are at or near "point of lay," drastically reducing the lead time compared to raising chicks. They also require less labor and equipment, as they are already past the delicate chick stage. Generally the best result comes from birds that have not quite started laying and have time to adapt to their new environment.

However, sourcing adult layers can be challenging. High-production hens of good quality, such as ISA Browns or Hy-Lines, are often in high demand and difficult to find in the quantities you need, especially on your preferred timeline. When available, adult layers can come from two primary backgrounds:

1. **Barn-Raised Hens:** These birds are accustomed to controlled indoor environments, making them harder to acclimate to pasture-based systems. It may take several weeks for them to settle, during which egg production might drop.
2. **Free-Range Hens:** While they may adapt more easily to a pastured system, they are harder to source in large numbers. Additionally, free-range birds carry a higher risk of disease exposure, which can introduce health challenges to your flock.

### **Recommendations**

If the option is available, purchasing **16+ week old high-production layers** is a practical choice for a quicker return on investment. However, it's important to plan ahead, as finding quality adult hens often requires securing them well in advance. For those unable to source adult layers reliably, raising chicks can still be a highly viable option if managed carefully.

Ultimately, the decision between chicks and adult layers comes down to balancing upfront labor, time, and resources with your operation's goals for profitability and productivity. Both approaches can lead to success when planned thoughtfully.

### **Flock Rotation**

Rotating your flock is an essential part of maintaining a profitable laying operation. Over time, even the best layers experience a natural decline in production, making it critical to plan for their replacement while managing the transition effectively. By strategically timing flock rotation, you can ensure consistent egg production and maximize the return on your investment.

Starting with reliable, high-production breeds is key to ensuring the profitability of your flock rotation system. Birds like ISA Browns, Hy-Lines, or Leghorns lay consistently through their first 18 months, providing the foundation for strong resale or extended use.

### **Why Rotate at 18 Months?**

At around 18 months, most high-production hens begin to slow down, typically dropping below the profitability threshold for commercial egg sales. While these birds still have many eggs left to give, their efficiency no longer aligns with the demands of a profit-driven operation. At this stage, I recommend selling them rather than processing.

### **Selling vs. Processing Spent Hens**

- **Reselling Hens:** Selling 18-month-old hens is a practical and profitable option. These birds can still produce a significant number of eggs for backyard chicken keepers or hobbyists. Selling them for **\$10 per hen** is entirely reasonable, especially if they are from high-production breeds. This approach not only helps offset the cost of their replacements but also avoids the labor and logistical challenges of processing.
- **Processing Hens:** While processing spent hens is an option, it is labor-intensive and requires significant time and equipment. The market for stewing hens is limited, but it may still be a viable option for farms that have the capacity to process birds or cater to local markets seeking soup stock or bone broth ingredients.

### **Alternative Approaches to Flock Rotation**

For some operations, it may make sense to keep a portion of the flock for 2–3 years rather than rotating them out at 18 months. Older hens often lay **larger eggs**, including jumbos, which can command a premium price in some markets. If there's demand for jumbo eggs in your area, keeping hens longer can be a profitable strategy.

Another approach is to keep birds for up to three years before processing. While egg production will decline steadily, the extended laying period can offset the costs of maintaining older hens if you're able to market their larger eggs effectively. At the three-year mark, processing the birds for stew or soup hens might be a practical way to recoup additional value. There may also be someone in your area who will buy these hens and process for their own market.

**Please ensure that your hens are sold into humane circumstances**, whether for a quick, respectful end or to a home where they will be well cared for. It's important to avoid situations where birds might face abuse, neglect or poor living conditions. Taking a little extra care in choosing where your hens go reflects the same ethical responsibility you maintain in raising them.

### **Molting and Resale Benefits**

When hens are moved to a new environment, they often go through a molt. While this temporary pause in egg production might seem inconvenient, it's actually a benefit for both the hens and their new owners. Molting allows the birds to refresh their plumage and reset their laying cycle, often leading to another round of productive egg-laying.

By tailoring your flock rotation strategy to your market and resources—whether through reselling, extended laying, or processing—you can maintain profitability while adapting to changing needs and opportunities.

## **Housing Options for Pasture Based Systems**

Pasture systems are an excellent way to integrate chickens into a farm's ecosystem, promoting soil health while allowing the birds to forage and exhibit natural behaviors. While the grazing season is limited in Colorado, chickens still find green bits to forage on as long as the ground isn't covered in snow, making pasture access valuable year-round.

### **Permanent Housing with Adjacent Pastures**

For operations with permanent, non-mobile housing, pasture rotation is key. On our farm, the coop is adjacent to two paddocks that we rotate 4–5 times per year. This method reduces overgrazing, spreads the nutrient load evenly, and promotes pasture regrowth. To further enhance our soil, we scatter chicken litter across other parts of the pasture, recycling nutrients and reducing waste. This system works well for our setup, though it requires careful planning to prevent pasture degradation.

We've also experimented with rotating chickens around a large greenhouse, but this system presented challenges. The greenhouse was destroyed in a windstorm, and even with reflective shade cloth, it was difficult to keep cool in summer, making it less suitable for our climate.

### **Mobile Coop Systems**

Mobile coops, or “chicken tractors,” are widely regarded as the best option for soil health in a pasture-based system. These coops allow you to move the birds frequently, preventing overgrazing and concentrating manure in one area. Mobile systems integrate seamlessly with regenerative agriculture practices by evenly distributing nutrients and reducing bare patches in the pasture. While there are many designs available, the key features to prioritize in Colorado’s climate are adequate shade and ventilation. Chickens in mobile coops need access to shaded areas to stay comfortable during the hot summer months, as heat stress can affect both their health and egg production.

Most farmers using mobile coop systems transition their birds to separate winter housing during the colder months. This can include winter sheds, insulated barns, or greenhouses. Greenhouses are an excellent solution for providing warmth, as they naturally retain heat and can extend the foraging season if designed to include some pasture access. Just be sure to ensure adequate ventilation in winter housing to prevent condensation, which can lead to frostbite and respiratory issues.

Whether you’re using permanent housing or a mobile coop system, certain features are non-negotiable for maintaining the health and productivity of your flock. These include:

### **Roosting Bars**

Chickens naturally roost at night, and providing appropriate roosting space ensures they remain comfortable and healthy. Each bird needs approximately 10 inches of roosting space to prevent overcrowding and competition. Roosts should be made of sturdy material, such as wood. Flat 2x4’s are better than round roosting bars as chickens can entirely cover their feet in winter.

### **Nesting Boxes**

Nesting boxes are critical for clean and consistent egg production. Roll away nest boxes are excellent for keeping eggs clean and avoiding egg eaters (links in Resources). Although many guidelines advise 4-5 boxes per hen, we have found one box to 10 hens is perfectly reasonable, especially for larger or community style nest boxes. Boxes should be lined with clean bedding and positioned in quiet, shaded areas of the coop to encourage use. Properly designed nest boxes prevent hens from laying on the floor, reducing egg breakage, egg eating and contamination.

### **Shade and Ventilation**

In Colorado’s hot climate, providing sufficient shade is non-negotiable for any pasture system. Shade can come from natural sources like trees or artificial structures such as tarps, shade cloth, or mobile shelters. Ensuring birds have access to shade not only protects their health but also encourages more time spent foraging, which reduces feed costs and benefits the pasture.

## **Nutrition**

### **The Importance of Balanced Feed for High-Production Layers**

Feed is another key to a successful laying operation, particularly when working with high-production breeds. These birds are bred to lay at exceptional rates, and their nutritional needs are far higher than those of heritage or dual-purpose breeds. A balanced feed formula ensures they can sustain high egg production without compromising their health or the quality of the eggs.

We have owned a feed mill and collaborated with one of the country’s top poultry nutritionists to design chicken rations tailored to the unique needs of laying hens. Based on this experience, I cannot overstate the importance of providing high-quality, nutritionally complete feed.

Even when on pasture, high production laying hens should have unrestricted access to feed at all times. Foraging alone cannot meet their nutritional needs, even under ideal conditions. Studies show that pasture foraging typically offsets only about **10% of a bird's feed intake**, meaning the majority of their energy and nutrient requirements still come from their formulated ration. Restricting feed or failing to provide a balanced formula will negatively impact egg production, bird health, and overall profitability.

In addition to fewer eggs, chickens with nutritional deficiencies can also have major issues such as egg eating, feather picking, egg prolapse, sour/pendulous crop, and even cannibalism. From my own experience, once these issues come up in your flock, they are very difficult habits to break, even after fixing the deficiency. My first bulk feed formulation (before the help of our nutritionist) had plenty of protein, but was deficient in a few key vitamins, and it was the only time I have experienced cannibalism in my birds.

### **Feed Guidelines for Each Life Stage**

#### **1. Starter Feed (0–4 Weeks)**

Chicks require a high-protein starter feed, ideally with **20-22% protein**, to support rapid growth and development. A crumble texture ensures they can consume the feed easily, and balanced vitamins and minerals are critical for strong skeletal development.

#### **2. Grower Feed (5–20 Weeks)**

Pullets transition to a grower feed with **18-20% protein**, which supports their continued growth while preparing them for laying. Calcium levels should remain low at this stage (around 1%) to avoid stress on their developing kidneys.

#### **3. Layer Ration (20 Weeks and Beyond)**

Our nutritionist recommends switching to layer ration once half your hens are laying eggs. This allows the rest to continue growing to weight and will result in larger eggs faster. A proper layer ration contains **16–18% protein** and elevated calcium levels (3.5–4%) to meet the demands of shell formation. Poorly balanced layer feeds can result in weak shells, lower production, or health problems for the birds just as prolapse.

Chickens should have access to grit at all life stages. Free range birds will get plenty of this in a natural environment, so it's generally not necessary to supplement.

Providing supplemental calcium, such as oyster shells, in a separate feeder allows hens to regulate their own intake, ensuring they get the calcium they need for strong eggshells without overloading their diet. Hens will only consume calcium supplements when their bodies require it, making this an efficient and natural way to support their health.

Choosing between conventional, non-GMO, and organic feed plays a significant role in determining the cost of production and how you market your eggs.

**Non-GMO eggs** - For our own operation, non-GMO feed offers the best balance, allowing us to charge a premium price without the steep costs associated with organic feed. Non-GMO eggs typically appeal to customers who value a higher-quality product but are still price-conscious, making them a sweet spot for profitability.

**Organic eggs**, on the other hand, are considerably more expensive to produce. To achieve a good return on investment, organic eggs often need to be sold for **\$8–9 per dozen** or more, which can limit your



market to areas with strong demand for certified organic products. Before committing to organic production, it's critical to ensure your market can support those prices. Of course, if you run a certified organic farm, folks might expect eggs to also be organic, so it depends on your customer base and expectations.

**Conventional eggs**—from hens fed standard, non-premium feed—are typically cheaper to produce, but they may sell for **\$1–2 less per dozen** than non-GMO eggs. This option may work in areas where price sensitivity outweighs concerns about feed quality, but it may be harder to market at farmers markets or to customers seeking premium, pastured eggs. However, some customers prioritize pastured systems over feed type, so understanding your local market is key to finding the right balance for your operation. It can also depend on if you are the only person offering more affordable eggs at a farmer's market – this might appeal to price conscious shoppers who still want the healthiest eggs they can afford.

Special Note – There have been ongoing concerns about the quality of conventional feed, particularly related to the presence of glyphosate residues. While definitive conclusions are lacking, there is speculation that high levels of glyphosate in feed could lead to issues such as disruptions in gut health, reduced nutrient absorption, and potentially lower laying rates. A couple years ago, there were anecdotal reports of hens experiencing significant drops in egg production, which some attributed to certain feeds. Though this could have been coincidental or due to other factors, it's something worth considering when selecting feed for your flock.

If you're concerned about feed quality, opting for non-GMO or organic feed may reduce exposure to glyphosate residues and provide added peace of mind. While these options come at a higher cost, they could alleviate potential long-term issues and appeal to customers who prioritize feed quality in their purchasing decisions.

Some people advocate for fermenting feed, a process where feed is soaked for 24–48 hours before being fed to the flock. While some studies suggest that properly fermented feed can offer slight advantages, my own experiments with this method did not show a noticeable reduction in feed consumption or improvement in egg production. Additionally, fermentation carries risks such as harmful bacterial growth, and I observed instances of sour crop in hens when using fermented feed. Most of the benefits of fermentation can be achieved if your feed is supplemented with a simple poultry probiotic, which is highly recommended and well researched. I recommend sticking to simpler, safer feeding methods to ensure optimal flock health and performance. However, if you choose to try fermentation, be sure to provide only the amount your hens can consume in a single day to minimize risks.

### **Feeder Systems**

Minimizing feed loss is crucial to profitability. There are several types of feeders that work particularly well, and links can be found at the end of this handbook. I do **not** recommend those galvanized aluminum feeders with the tray at the bottom, as the birds seem to kick out and waste a large amount of feed.

If you are feeding a mash, I have had excellent results with mixing feed with water into a mash to minimize waste. I use a cordless drill and paddle attachment to mix the feed in 5 gallon buckets. I provide only enough feed for the day with dry feed as a backup, so such a system does take some extra work. It seems to stimulate appetite and keeps the birds eating more at temperature extremes, which equates to better egg production.

### **The Critical Role of Water in Egg Production**

Water is the most important nutrient for laying hens, directly influencing their health, productivity, and egg quality. A single hen can drink up to 1 pint of water per day, and this requirement increases significantly in hot weather. Research has shown that even a slight restriction in water availability can lead to a rapid decline in egg production, as water constitutes roughly 70% of an egg's weight.

When water intake is insufficient, hens not only lay fewer eggs but may also produce smaller eggs with weaker shells. Ensuring constant access to clean, fresh water is essential for maintaining flock health and optimizing egg production.

During the shorter days of winter, it's ideal for hens to have access to both food and water inside the coop, as this supports maximum egg production. However, food can attract pests, so decide what works best for you. On our farm, our birds don't have food after 6:30pm when their doors close, but they do have access to water 24/7.

### **Choosing the Right Watering System**

While nipple waterers are a popular choice due to their cleanliness and ability to reduce waste, not all systems are created equal. Some nipple waterers have inadequate flow rates, which can be particularly problematic during summer months when hens need more water to stay cool. Low-flow systems can lead to dehydration and stress, ultimately affecting productivity.

To avoid these issues, ensure your watering system is designed to meet the demands of your flock size and environmental conditions. High-flow nipple waterers or alternative systems like gravity-fed troughs or cup waterers can provide more reliable access to water, especially in hot climates.

### **Resources for Reliable Systems**

For links to recommended watering systems and tips on setup, refer to the Resources section of this handbook. Investing in a high-quality watering system will save time, reduce waste, and support your flock's overall performance and well-being.

## **Housing Considerations for Maximum Production and Profit**

### **Lighting**

By far the number one issue I see when people have issues with decreased egg production is inadequate or improper lighting. Lighting plays a critical role in egg production, as hens rely on consistent light exposure to stimulate their reproductive systems. Hens will slow down their egg production starting as early as July as the days get shorter. Without enough light, particularly during the shorter days of winter, many hens will stop laying entirely. This is because light signals their bodies to produce eggs, and their reproductive systems shut down when daylight is insufficient. To maintain production, it's crucial to provide 14-16 hours of light daily.

Some chicken keepers are hesitant to use supplemental lighting in their coops, preferring to allow their hens a natural "rest" during the winter months when daylight hours are shorter. While this approach is aligned with letting birds follow their natural rhythms, it poses a significant challenge for profitability. Winter is often when egg demand is highest, and the reduced production can make it nearly impossible to cover feed costs, let alone turn a profit, without extending lighting.

Just as with heating, introducing supplemental lighting should include an economic consideration. The cost of running a small LED bulb on a timer is minimal compared to the revenue lost from decreased egg production. Providing consistent lighting during the winter months ensures hens continue laying, helping operations remain financially sustainable. By balancing care for the hens with the economic realities of a laying operation, supplemental lighting becomes an essential tool for success.

High-production breeds are specifically bred to lay a large number of eggs per year, often exceeding 300 eggs at peak performance. However, their impressive productivity is heavily influenced by lighting conditions. These breeds rely on consistent, long days to stimulate their reproductive systems, which are finely tuned to respond to light exposure. Without sufficient lighting, even the best high-production hens will reduce or stop laying, as their bodies interpret the shorter days of winter as a signal to rest.

For farmers using high-production breeds, supplemental lighting is essential to maximize their potential. These hens are bred to work hard, and with proper light management—providing 14-16 hours of light daily—they can maintain steady egg production even during the darkest months. Without lighting, the investment in high-production breeds may not yield its full return, as their egg-laying potential is limited by the natural seasonal light cycle. Adding supplemental lighting ensures these birds perform to their genetic capacity, helping operations achieve profitability year-round.

You will want to use warm-spectrum lighting, around 3,000K, to replicate the natural daylight hens need. Do NOT use “cool,” “natural daylight” or incandescent light. A 40-60 watt soft white LED bulb is usually sufficient for small coops, but larger spaces may require multiple bulbs to ensure even illumination. Position the light so it brightens the coop, including nesting boxes and roosts, as this consistency encourages laying. Brighter bulbs may be needed in high ceilings. Installing a timer ensures hens receive reliable light exposure, with the light coming on early in the morning and turning off in the evening. If you have wifi in your barn, programmable lightbulbs such as Wiz are an amazing and economical solution and offering dimming features over half hour time periods, mimicking sunrise and sunset.

Not only does lighting impact egg production, but it also helps guide hens into the coop at night, promoting roosting habits. During transitions or when hens are reluctant to go outside, leaving the light on in the coop will encourage them to go inside.

### **Climate Control**

The ideal temperature range for optimal egg production in laying hens is 65–75°F (18–24°C). Within this range, hens are most comfortable and can efficiently use their energy for laying eggs rather than regulating body temperature. Here are some ways temperature influences egg production:

1. **Comfort Zone:** Hens are warm-blooded animals and perform best when environmental temperatures align with their natural comfort zone.
2. **Energy Balance:** At temperatures above 75°F, hens divert energy to staying cool, which can reduce egg production. Similarly, when temperatures drop below 65°F, they expend more energy staying warm, which can also decrease laying efficiency.
3. **Eggshell Quality:** Consistent temperatures in this range also support better calcium metabolism, resulting in stronger eggshells.

Of course, most small farms and operations won't be able to maintain temperatures at this ideal range. However, there are several steps we can take to maximize comfort, and therefore productivity and profit,

for our hens. Utilizing proper ventilation, insulation, and safe heating or cooling systems can go a long way in supporting consistent egg production.

### **Insulation**

Insulating a coop helps maintain a stable temperature, reducing the stress on hens during extreme heat or cold. By minimizing drafts and retaining warmth, insulation can lower feed consumption and support consistent egg production. Proper insulation also reduces the risk of frostbite and helps protect your flock from sudden temperature swings.

### **Ventilation**

Proper ventilation is just as critical as insulation when heating a coop. Without adequate airflow, condensation can build up, leading to health issues and even frostbite in your flock. Ensure there are vents or windows that allow for air exchange without creating drafts. Larger barns benefit from installation of wall fans ([link in Resources](#)).

### **Summer Considerations:**

Keeping hens cool during the summer months can be a challenge, especially in hotter climates, but it's essential to their health and productivity. Providing plenty of shade is one of the simplest and most effective strategies. Whether it's from trees, shade cloth, or tarps, shaded areas give hens a place to escape direct sunlight. Water access is equally critical—hens need fresh, cool water throughout the day, and adding ice to their waterers during extreme heat can make a big difference.

Ventilation plays a crucial role in keeping the coop comfortable. Properly placed windows and vents promote airflow, while agricultural-grade fans, designed to handle dusty environments, can help move air when natural ventilation isn't enough. Mistlers can be another effective tool if water is adequate. Cool grass in pasture based systems are a wonderful place for hens to stay cool, especially when combined with shade.

Hens also appreciate cool treats like frozen fruit or vegetables, which help keep them hydrated and offer relief from the heat. Their natural behavior of dust bathing is another way they cool down, so maintaining dry, loose soil in shaded areas ensures they can regulate their temperature naturally. Thoughtful coop design—such as light-colored paint to reflect sunlight and insulated roofs to reduce heat buildup—can also help manage temperatures and keep your flock comfortable through the summer.

It's normal to experience a drop in egg production during the hottest days of the year. However, if egg production drops severely, ensure hens are getting adequate water and shade.

### **Winter Considerations:**

#### **Why You Might Consider Heating Your Coop**

While it's common for homesteaders and backyard chicken keepers to avoid heating their coops, there are good reasons to reconsider this approach when running a small laying operation. Chickens eat to maintain their body temperature, so in colder weather, their feed consumption can skyrocket as they burn calories just to stay warm. This increased feed demand can add up quickly, and depending on your setup, it may actually be cheaper to provide supplemental heat than to cover the cost of extra feed.

#### **Feed Costs vs. Heating Costs**

Let's say a hen normally eats 0.25 pounds of feed per day. During cold weather, her consumption might increase by 25–50%, meaning she'll eat an additional 0.06–0.13 pounds of feed daily. For 100 hens, this

means an extra 6–13 pounds of feed per day. Over three months of cold weather, this adds up to 540–1,170 pounds of additional feed. At \$0.30 per pound, this translates to \$162–\$351 in extra feed costs. In contrast, running a small heater or heat panel in a well-insulated coop might cost around \$1–\$2 per day in electricity, totaling \$90–\$180 for the same three-month period. In this scenario, heating the coop could save money while keeping your flock more comfortable.

### **Cold Affects Egg Production**

Even if hens are well-fed, extreme cold can cause them to divert energy away from laying eggs and toward maintaining their body temperature. This means fewer eggs during the winter months, even if you're covering their increased caloric needs and artificially lighting the coop. Supplemental heat ensures that the hens can maintain their body heat without sacrificing egg production.

### **The Balance Between Heat and Safety**

Using a safe heating system is essential to prevent fire risks and ensure the well-being of your flock. **DO NOT USE HEAT LAMPS!** They pose a severe fire hazard and are not suitable for safe coop heating. Heat lamps are a common cause of coop fires and can be devastating to your flock and farm.

Instead, consider using safe options like:

- Heat Panels: Ideal for small coops or as supplemental heat in larger spaces.
- Oil Core Heaters: Reliable and efficient, offering consistent heat with minimal fire risk.
- Ceramic Heaters: Effective, though they can collect dust, which may require regular cleaning.
- Electric Baseboard Heaters: These work very well in larger spaces when installed securely off the ground (18-24"). We use these in our barn with fantastic results, and simply run a small shop vac over them weekly to control dust.
- Greenhouse Heaters: Some propane-powered models are designed to be safe and efficient for enclosed spaces.

Selecting the right heating system and ensuring proper installation is critical for balancing safety and warmth in your coop. Always prioritize safety! Chickens are remarkably resilient to cold when properly acclimated, and a slight drop in egg production is far preferable to creating an unsafe, fire-prone environment.

### **When Heating Makes Sense**

Heating the coop may not be necessary in mild climates, but in regions with sustained freezing temperatures, it can reduce feed costs, maintain consistent egg production, and ensure your flock stays comfortable and healthy. For small operations relying on winter egg sales, it's an investment that can pay off.

Proper ventilation is just as critical as insulation when heating a coop. Without adequate airflow, condensation can build up, leading to health issues and even frostbite in your flock. Ensure there are vents or windows that allow for air exchange without creating drafts.

## **Hen Health: Key Considerations**

Maintaining the health of your flock is essential for a productive and ethical operation. While this topic is extensively covered in other resources, here are some key points to keep in mind:

## The Reality of Veterinary Care

Access to veterinary care for poultry can be limited, and when available, it's often prohibitively expensive. As a result, small-scale farmers must be proactive in preventing illness and managing minor health issues on their own.

## First Aid Essentials

Having a well-stocked first aid kit is crucial for addressing common injuries and ailments. Items to include:

- Antibiotic ointment
- Styptic powder
- Gauze and vet wrap
- Poultry-safe antibiotics and probiotics
- Electrolytes for water
- Tweezers and scissors
- Anti-pick lotion (we do NOT recommend Blu-kote as it can burn skin)
- Honey – this can be used extremely effectively for wound care and has many well-researched benefits, including analgesic and antibiotic properties
- Dewormer – we recommend SafeGuard, which does not have an egg withdrawal period. Generally we do one worming in the spring around end of mud season.
- Mite/lice dust or spray – Elector PSP works best (and is approved for organic operations), but can be costly. Permethrin sprays or dust work well, but be careful with these if you have barn cats as they are toxic to cats.

We do NOT recommend diatomaceous earth for worm and mite/lice control. Some producers use DE as a natural method to control external parasites like mites and lice. However, its effectiveness in this application is not well-documented. Additionally, inhalation of DE dust can cause respiratory irritation in both humans and animals. Poultry lungs are very sensitive, and there are safer, more effective alternatives for pest control.

## Sick Birds: Isolate and Assess

Any sick or injured hen should be immediately **isolated** from the flock to prevent the spread of illness and minimize stress on the affected bird. Monitor for symptoms of serious diseases like respiratory distress, unusual droppings, or lethargy. When in doubt, it's better to humanely dispatch a suffering bird than to prolong its discomfort.

## Watch for Serious Diseases

Stay alert for signs of significant diseases, including respiratory infections and intestinal parasites. Pay close attention to symptoms of **avian influenza**, such as sudden drops in egg production, swelling, death in a large number of birds, or unusual behavior.

## Avian Flu Best Practices

To protect your flock from avian influenza, implement biosecurity measures:

- Limit visitors and contact with wild birds.
- Disinfect shoes, equipment, and tools before entering the coop.
- Avoid sharing equipment with other farms.
- Report any suspected cases to local authorities for guidance.

If veterinary care becomes necessary, it's important to know where to turn. Research local vets or extension services that work with poultry, and keep their contact information handy. While care may be limited, having a trusted resource can be invaluable in serious situations.

While this section is brief, prioritizing prevention, quick response, and humane treatment will go a long way in ensuring a healthy and productive flock. For more detailed information, there are many specialized poultry health resources available.

## **Controlling Predation**

Everything likes to eat chicken, and sometimes I swear chickens TRY to be eaten! Protecting your flock from predators is essential in a pasture-based poultry system. Predation threatens the welfare of your birds and can lead to significant financial losses. Effective predator management ensures the safety of your flock and supports the sustainability of your operation.

### **Electric Fencing**

Electric fencing is the most effective and humane ways to protect your flock, and I highly recommend this investment for pasture-based systems. On our farm, we use **Premier1 PoultryNet** (link in Resources) with a solar charger, and we have very few issues with predation. This setup effectively deters common predators like foxes, coyotes, racoons, skunks, and stray dogs. For those on a tighter budget, a simple two-strand electric fence can provide adequate protection. While chickens may occasionally wander/fly outside the fenced area, they quickly learn the "safe zone," and the fence offers a vital barrier against threats. When choosing an electric fence charger, use a pulse charger to avoid the very real fire hazards associated with older continuous models (we once used a plug-in continuous charger and caught our field on fire. We were VERY lucky we were there to quickly stop the flames!)

### **Livestock Guardian Dogs (LGDs)**

Livestock guardian dogs are another excellent option for predator control, especially on larger farms or operations with mixed livestock. Breeds like Great Pyrenees, Anatolian Shepherds, and Maremma Sheepdogs which are specifically trained to protect flocks and are highly effective against both ground and aerial predators. However, using LGDs requires commitment to proper training and management to ensure the dogs interact appropriately with the birds and stay focused on their role. We have an LGD who is mostly useless as we never got her over chasing chickens (probably our fail at training, honestly), but she still is VERY good at deterring coyotes if they start hanging around. She is a fantastic waterfowl guardian though.

Other predator deterrents include motion-activated lights, sprinklers, and sound devices. Our chicken runs, which we typically let the birds out of during the day, are covered with 2-inch hex wire to deter predators at dusk when the birds are often still outside before roosting. While not as effective as electric fencing, tall, well-maintained perimeter fencing can offer an additional layer of security.

## **Marketing Your Eggs for Maximum Profitability**

Marketing your eggs effectively is essential to running a profitable laying operation. With egg prices at historic highs, it's entirely reasonable to charge **\$6–\$7 per dozen**, or even more in tourist areas or high-cost-of-living markets. Many farmers undervalue their eggs out of fear that people won't pay, but it's important to remember that you're providing a premium product. Pastured eggs are fresher, more nutritious, and more sustainable than grocery store options, and consumers are willing to pay a fair price for quality.

## Marketing Strategies

### 1. Local Visibility

Roadside signs, social media, and advertisements at local farm stands are great ways to attract customers. A **simple website** showcasing your operation and how you care for your birds can also build trust and interest. Farmers markets are particularly effective, as they not only drive egg sales but also introduce customers to your other products. Eggs are often a gateway item for customers to build loyalty and increase their spending on additional farm goods.

### 2. Advertising Beyond the Basics

Many farmers struggle to sell eggs for more than \$4/dozen because their marketing efforts don't go far beyond a roadside sign or word of mouth. Expanding your reach through social media ads or partnering with local businesses can significantly boost your visibility. For example, collaborating with a CSA or farm store allows you to reach customers who already value local, fresh food.

## Wholesale vs. Direct Sales

There are two main avenues for selling your eggs, each with its own advantages:

- **Direct Sales:** Selling directly to customers (at the farm gate or farmers markets) often brings the highest profit margins. These customers are happy to pay top dollar for premium eggs, especially when they understand the story behind your operation.
- **Wholesale:** Selling wholesale to retailers, restaurants, or other bulk buyers is more efficient and allows you to sell large quantities at once. A **reasonable wholesale price** is about **\$5.50–\$6.00 per dozen**, depending on your location, as retailers often mark them up significantly.

If selling to restaurants, consider using flats instead of cartons. Flats are cheaper, save time, and help offset the lower margins of wholesale sales.

## Licensing Requirements

In Colorado, if you're sticking to direct sales at farmers markets or your farm, the license isn't required if you sell less than 250 dozen a month. Proper labeling is still required, and eggs must be packaged in new cartons. Obtaining an **egg dealer's license** is required if you plan to sell to wholesalers, retailers, or restaurants. The cost is \$25/year and does not require on-site inspection (our farm has never been inspected, and I believe they generally only inspect if there are customer complaints). It's an affordable option with straightforward requirements. Eggs must be washed, packaged and labeled according to state standards, which are reasonable for most small farms. Having the license can increase your credibility and open up new market opportunities.

## Packaging Tips

Egg cartons are an often-overlooked expense, and shopping around for affordable options is critical. While I see many folks packaging in used cartons, technically all eggs are legally required to be in new packaging. You do you, but remember that using fresh cartons gives you an opportunity for branding. Links to recommended suppliers can be found in the Resources section. We recommend stamping egg cartons vs. paper labels for efficiency and minimal cost. For wholesale buyers, using flats instead of individual cartons saves both time and money while maintaining professionalism. Flats are especially ideal for restaurants or other high-volume buyers.

## Charge What You're Worth

It's important to remember that **eggs will sell at fair prices**, even if some customers complain. Not everyone is your customer, and those who value fresh, pastured eggs will gladly pay \$6–\$7 per dozen or



more. By marketing effectively and pricing confidently, you'll ensure your operation remains sustainable and profitable.

## **Final Lessons Learned, aka I Have Done Every One of These Wrong!**

Running a profitable laying operation requires careful management, but even small missteps can lead to significant losses. Here are the top mistakes that can derail success and how to avoid them:

1. **Wrong Breed Selection**

Choosing the wrong breeds is one of the most common mistakes and can spell disaster for profitability. Many breeds simply don't produce enough eggs to justify their feed costs. High-production breeds like ISA Browns, Hy-Line Browns, or Leghorns are essential to ensure your flock lays consistently and efficiently. Research your hatchery's lines carefully to avoid breeds that won't meet your production needs.

2. **Inadequate Predation Control**

Predators can wipe out a flock in a single night, making proper security non-negotiable. Ensure coops and runs are predator-proof with secure latches, hardware cloth instead of chicken wire, and nighttime lockdowns. Pastured flocks should have mobile shelters and protection from aerial predators like hawks.

3. **Not Using Artificial Lighting**

Without sufficient light during the shorter days of winter, hens naturally reduce or stop laying altogether. While some people hesitate to use artificial lighting, it's difficult to maintain profitability without it. Providing 14–16 hours of light per day keeps hens in peak production and ensures a steady supply of eggs during high-demand months.

4. **Improper Feed**

Providing inadequate nutrition will lead to health problems, reduced egg production, and financial losses. Laying hens require a properly balanced layer feed with adequate protein (16–18%) and calcium to support egg production and shell quality. Skimping on quality or using inappropriate feeds will cost more in the long run.

5. **Feed Loss**

Feed waste is a profit killer. Spilled feed, rodent infestations, and poorly designed feeders can result in significant losses over time. Invest in efficient feeders that minimize spillage and protect feed from pests, and always store feed in secure, dry containers.

6. **Keeping Old Hens**

This is my personal number one killer of profitability, as I still have many of my original hens from 7-9 years ago! Spent hens must be rotated out of your operation as they age and their productivity declines. Holding onto older birds significantly reduces the efficiency and financial viability of your flock. (I keep a "pet flock" of my favorite birds and spoil them to the end of their days).

By avoiding these pitfalls, you can create a well-run operation that maximizes efficiency and profitability while ensuring the health and productivity of your flock.

We wish you all the best in your hen laying adventures!

## Resources

### Laying Chicks and Adult Hens:

[www.sunshinemesafarm.com](http://www.sunshinemesafarm.com)

[www.whitingfarmshatchery.com](http://www.whitingfarmshatchery.com)

### Product Recommendations – I use all of these products:

#### Feeders

- King Feeder with Grill - Our favorite 50lb feeder – be sure to get the grill - [https://www.premier1supplies.com/p/king-feeder-clear-without-grill-55-lb?species\\_id%5B0%5D=6&criteria=feeder](https://www.premier1supplies.com/p/king-feeder-clear-without-grill-55-lb?species_id%5B0%5D=6&criteria=feeder)
- DIY Garbage Can Feeder - <https://www.youtube.com/watch?v=nnCCyh5ftPA>

#### Waterers

- Wise Mountable Drinker for Indoor use – best waterer to avoid leaks/spills - <https://hatchingtime.com/products/wise-drinker-wall-mounted-poultry-game-bird-drinker>
- DIY Outdoor Waterer - 5 Gallon Square Bucket - [https://www.lowes.com/pd/CRAFTSMAN-Medium-5-Gallons-20-Quart-Black-Heavy-Duty-Tote-with-Latching-Lid/1000976088?store=&cm\\_mmc=shp\\_-c\\_-prd\\_-dcr\\_-ggl\\_-PMAX\\_DCR\\_000\\_Priority\\_Item\\_-1000976088\\_-online\\_-0\\_-0&gad\\_source=1&gclid=CjwKCAiAk28BhB0EiwAM001TYf5Xpls2lzMbIHSLFrc2hVwU6aTaikY-jl8QfpjMO66aifUBK8yYhoCPoUQAvD\\_BwE&gclidsrc=aw.ds](https://www.lowes.com/pd/CRAFTSMAN-Medium-5-Gallons-20-Quart-Black-Heavy-Duty-Tote-with-Latching-Lid/1000976088?store=&cm_mmc=shp_-c_-prd_-dcr_-ggl_-PMAX_DCR_000_Priority_Item_-1000976088_-online_-0_-0&gad_source=1&gclid=CjwKCAiAk28BhB0EiwAM001TYf5Xpls2lzMbIHSLFrc2hVwU6aTaikY-jl8QfpjMO66aifUBK8yYhoCPoUQAvD_BwE&gclidsrc=aw.ds)

#### Cup kits -

[https://www.amazon.com/gp/product/B0BZRWF6TP/ref=ppx\\_yo\\_dt\\_b\\_search\\_asin\\_image?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B0BZRWF6TP/ref=ppx_yo_dt_b_search_asin_image?ie=UTF8&psc=1)

#### Egg Cartons and Egg Boxes

- <https://www.mannlakeltd.com/poultry-farm/egg-handling/>  
Must buy ~500 at a time for free shipping

#### Egg Scrubber

- <https://www.mannlakeltd.com/poultry-farm/egg-handling/little-egg-scrubber/>

#### PoultryNet – Electrified poultry fencing

- [https://www.premier1supplies.com/p/poultrynet-plus-48-inch-starter-kit?cat\\_id=190](https://www.premier1supplies.com/p/poultrynet-plus-48-inch-starter-kit?cat_id=190)

#### Chick Heat Plate

- [https://www.premier1supplies.com/p/heating-plates-and-covers?cat\\_id=226](https://www.premier1supplies.com/p/heating-plates-and-covers?cat_id=226)

#### Chick Brooding Tub

- <https://www.tractorsupply.com/tsc/product/tuff-stuff-products-heavy-duty-oval-stock-tank-110-gal-2229862?store=1791&gStoreCode=1791&gQT=1>

## Nest Boxes

- HenGear, the Cadillac of nest boxes - [https://hengear.com/products/rollout-nest-box-small?currency=USD&variant=19383059654&utm\\_source=google&utm\\_medium=cpc&utm\\_campaign=Google%20Shopping&stkn=c9baf27ae65d&cmp\\_id=17348257136&adg\\_id=&kwd=&device=c&gad\\_source=1&gclid=CjwKCAiAkc28BhB0EiwAM001TSp0ynb1xm1lbqJBQQvcksCT8CrAHvx5sW4WZKNSixMISejUBq3NVxoCFIMQAvD\\_BwE](https://hengear.com/products/rollout-nest-box-small?currency=USD&variant=19383059654&utm_source=google&utm_medium=cpc&utm_campaign=Google%20Shopping&stkn=c9baf27ae65d&cmp_id=17348257136&adg_id=&kwd=&device=c&gad_source=1&gclid=CjwKCAiAkc28BhB0EiwAM001TSp0ynb1xm1lbqJBQQvcksCT8CrAHvx5sW4WZKNSixMISejUBq3NVxoCFIMQAvD_BwE)
- Cimuka – Hatching Time (this is our farm preference – they are light and durable): <https://hatchingtime.com/products/nesting-box-2-compartments-back-collection>
- Covered Cat Litter Box (more economical option and hens love them, but eggs can get dirty): <https://www.chewy.com/natures-miracle-silver-oval-hooded/dp/191386>

## Heating Solutions

- Coop Warmer - [https://www.chewy.com/cozy-products-flat-panel-chicken-coop/dp/169444?utm\\_source=google&utm\\_medium=cpc&utm\\_campaign=20908059015&utm\\_content=160401460754&gad\\_source=1&gclid=CjwKCAiAkc28BhB0EiwAM001TfliZ5SXChp3X94l-Uk3I81ckadruXv2yNvhIMO9RjA7KuVBDmeltRoCsw4QAvD\\_BwE](https://www.chewy.com/cozy-products-flat-panel-chicken-coop/dp/169444?utm_source=google&utm_medium=cpc&utm_campaign=20908059015&utm_content=160401460754&gad_source=1&gclid=CjwKCAiAkc28BhB0EiwAM001TfliZ5SXChp3X94l-Uk3I81ckadruXv2yNvhIMO9RjA7KuVBDmeltRoCsw4QAvD_BwE)
- Oil Core Heater - [https://www.amazon.com/DeLonghi-Comfort-Thermostat-Settings-Features/dp/B000TGDGLU/ref=asc\\_df\\_B000TGDGLU?mcid=7c5698c3cfa4311da2bf911ace6a88ff&hvocijdid=17677349573838270608-B000TGDGLU-&hvexpln=73&tag=hyprod-20&linkCode=df0&hvadid=721245378154&hvpos=&hvnetw=g&hvrnd=17677349573838270608&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmld=&hvlocint=&hvlocphy=9029174&hvtargid=pla-2281435180538&pssc=1](https://www.amazon.com/DeLonghi-Comfort-Thermostat-Settings-Features/dp/B000TGDGLU/ref=asc_df_B000TGDGLU?mcid=7c5698c3cfa4311da2bf911ace6a88ff&hvocijdid=17677349573838270608-B000TGDGLU-&hvexpln=73&tag=hyprod-20&linkCode=df0&hvadid=721245378154&hvpos=&hvnetw=g&hvrnd=17677349573838270608&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmld=&hvlocint=&hvlocphy=9029174&hvtargid=pla-2281435180538&pssc=1)

## Ventilation

- Wall Exhaust Fan – We use two 18” but for most setups a smaller fan is adequate - [https://www.lowes.com/pd/VEVOR-Shutter-Exhaust-Fan-12-in-Silver-Plastic/5014736057?user=shopping&feed=yes&srsItid=AfmBOoqDVcpibNeK\\_g-tJYaobicPMD\\_w3yPEwJWMxXFQ1NUrI9i4N4t9pWM&gQT=1](https://www.lowes.com/pd/VEVOR-Shutter-Exhaust-Fan-12-in-Silver-Plastic/5014736057?user=shopping&feed=yes&srsItid=AfmBOoqDVcpibNeK_g-tJYaobicPMD_w3yPEwJWMxXFQ1NUrI9i4N4t9pWM&gQT=1)